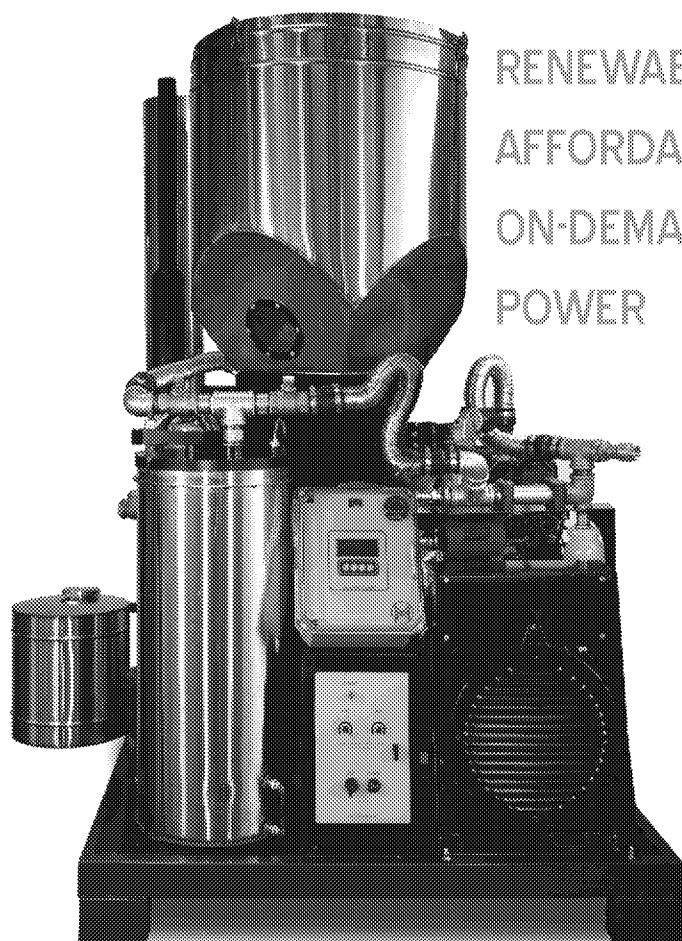


# ALL POWER LABS

## Personal-Scale Power

### POWER PALLET - PP20



PP20 - Basic Configuration

RENEWABLE  
AFFORDABLE  
ON-DEMAND  
POWER

The **Power Pallet** is a renewable power solution that is a sensible answer to a critical global problem. It meets the expectations for portable on-demand generators, is proudly made in California and available now at an affordable price.

APL's unique patented multi-stage gasification architecture, in combination with our innovative gasifier-engine thermal integration, our electronic control system and waste-heat recycling, gives the Power Pallet unprecedented biomass fuel flexibility and efficiency.

The Power Pallet uses agricultural and forestry waste materials that can be readily sourced very near the point of generation. It is compact and portable, easily transported in the bed of a pickup truck to where the fuel is and where the power is needed. Unlike diesel fuel or gasoline, this fuel is often available at little or no cost, and most importantly, depending on feedstock selection and use details, the Power Pallet can avoid the carbon impact of fossil fuels.

#### PERFORMANCE

|  |  |
|--|--|
| Continuous Power Rating:   | 15 kW@50 Hz/18 kW@60 Hz                      |
| Sound Level @ 30 feet:   | 85 dB(A)                                     |
| Biomass Consumption:   | 1.2 kg/kWh, 2.5 lbs/kWh                      |
| Run Time per Hopper Fill:<br>approximate @<br>250 kg/m <sup>3</sup> fuel density | 5 kW: 10 hrs<br>10 kW: 5 hrs<br>15 kW: 3 hrs |
| Max. Continuous Operation:   | >12 hours                                    |
| Start Up Time:   | 10-20 min.                                   |

#### OPERATING CONDITIONS

|  |   |
|--|---|
| Ambient Temperature:                                   | 5-40°C/40-100°F                                     |
| Humidity:  | 5-95% RH  |
| Installed Footprint:<br>without ash vessel or grid tie | 1.36 x 1.36 m<br>53.5 x 53.5 inches                 |
| Site Requirements:                                     | Well-Ventilated<br>protected from rain & direct sun |

#### FEEDSTOCK BIOMASS

|   |  |
|---|--|
| Size:   | 12-40 mm/0.5-1.5 in.   |
| Moisture Content:                                     | 10-30% dry basis   |
| Approved and Tested<br>w/ normal operating procedures | Walnut Shells<br>Softwood Chips (e.g. Fir, Pine)<br>Hardwood Chips (e.g. Oak, Ash) |
| Approved and Tested<br>w/ increased operating effort  | Corn Cobs<br>Coconut Shells<br>Palm Kernel Shells                                  |
| Not Approved<br>dangerous & voids warranty            | Coal<br>Tires<br>Plastic<br>Municipal Solid Waste                                  |

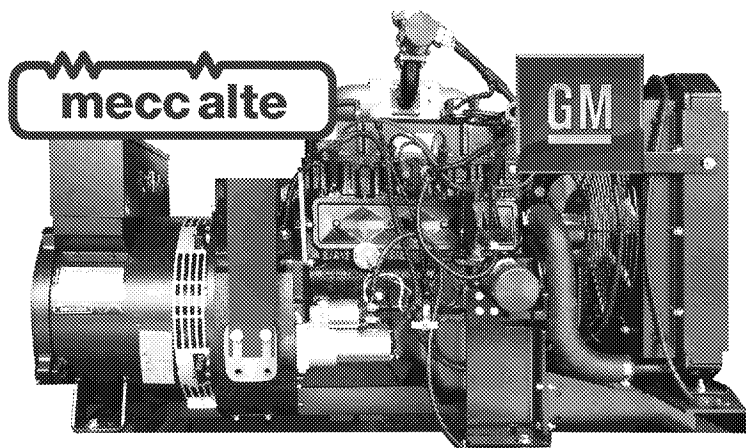
#### SHIPPING

|             |                                  |  |
|-------------|----------------------------------|--|
| Dimensions: | PP20 - Crated<br>Hopper - Crated | 145 x 145 x 140 cm/57 x 57 x 54 in.<br>83 x 83 x 114 cm/33 x 33 x 45 in. |
| Weight:     | PP20 - Crated<br>Hopper - Crated | 700 kg/1550 lbs.<br>91 kg/200 lbs.                                       |

#### FUEL COST COMPARISON (VARIES BY REGION)

| FUEL             | PRICE RANGE                |
|------------------|----------------------------|
| Diesel/LPG       | \$0.40 - \$0.75/kWh        |
| Gasoline         | \$0.50 - \$1.00/kWh        |
| Gasified Biomass | <b>\$0.00 - \$0.20/kWh</b> |

All specifications are subject to change without notice



Mecc Alte NPE32 Genhead

GM Vortec 3.0 I.C. Engine

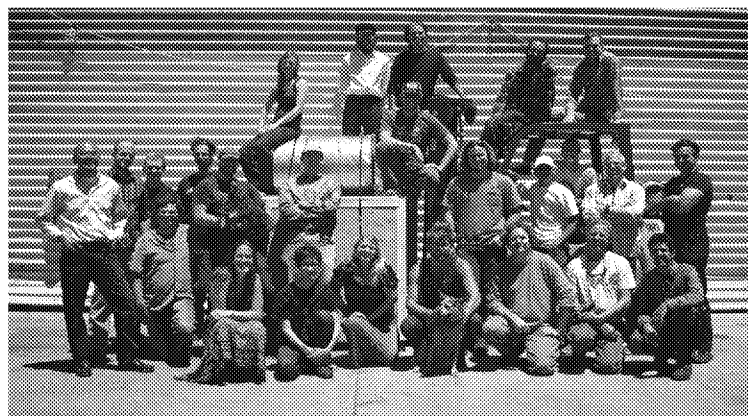
## ALL Power Labs

APL is the global leader in small-scale gasification technology. We make biomass-fueled power generators that are ready for everyday work, to serve real-world, distributed-energy needs. Our compact gasifiers are now at work in over thirty countries, and support research at more than fifty universities around the world.

Our APL team is an unusual combination of hands-on fabricators and university-trained scientists and engineers. The result is a powerful combination of technical ability and physical know-how for developing innovative energy solutions.

We are deeply committed to supporting and developing biomass energy conversion by curating and disseminating comprehensive information and data on gasification science and technology—online, in workshops, and free Open House events.

Our facility is in Berkeley, CA. Please contact us to arrange a visit the next time you are in the Bay Area. We'd love to show you around.



## WARRANTY

ALL Power Labs products are covered by a 100% money back guarantee. If you buy something & find yourself unimpressed with the value of the product or company, we'll refund all your money (minus shipping costs) within 30 days of delivery. APL directly warrants all parts we manufacture (i.e. gasifiers, electronics, & related components) for two years or 4000 hours, & passes along the OEM warranty for parts we source & configure into our end products (e.g. engines & genheads). See <http://allpowerlabs.com> for full details.

## GASIFIER

|                         |   |
|-------------------------|---|
| Type:                   | APL v5 Patented<br>Thermally Integrated Downdraft |
| Materials:              | 304 SS/310 SS/<br>321 SS/mild steel               |
| Hearth:                 | Coated Ceramic                                    |
| Ash Removal:            | Automated<br>12 hour batch vessel                 |
| Fuel Feed:              | Automated   |
| Hopper Capacity:        | 0.33 m <sup>3</sup> /88 gallons                   |
| Hopper Filling:         | Batch - refill while operating                    |
| Min. Maintenance Cycle: | ~ 12 hours  |
| Control System:         | On-Board Automation                               |

## ENGINE

|                         |  |
|-------------------------|--|
| Type:                   | GM Vortec                                    |
| Displacement:           | 3.0 liter                                    |
| Compression Ratio:      | 10.25:1                                      |
| RPM:                    | 1500@50 Hz 1800@60 Hz                        |
| Valve Configuration:    | Overhead, Pushrod                            |
| Engine Block/Cyl. Head: | Cast Iron w/ exh. valve inserts              |
| Ignition:               | Solidstate Distributor                       |
| Spark Timing:           | Fixed  |
| Lube Oil Capacity:      | 5 quarts - including filter                  |
| Coolant Capacity:       | 11.4 L, 12 qts - incl. radiator              |
| Auto Shutdown:          | Low Oil Pressure<br>High Coolant Temperature |
| Starter:                | Reduction Gear PG-260L                       |
| Charging System:        | Delco-Remy 7-SI (70 A)                       |
| System Voltage:         | 12 V DC                                      |
| Recommended Battery:    | 75Ah, 880 CCA Marine                         |
| Battery Footprint:      | 250 x 300 mm/10 x 12 in.                     |
| Speed Control:          | Electronic Governor<br>Woodward L-Series     |
| Oxygen Sensor:          | Bosch Wide Band                              |

## GENERATOR

|                            |                                   |
|----------------------------|-----------------------------------|
| Type:                      | Mecc Alte NPE32-E/4 12 wire       |
| AVR:                       | Mecc Alte DSR                     |
| Available Voltages:        | 190-277, 380-480 V AC             |
| Available Topologies:      | Series Delta/Star, Parallel Delta |
| Total Harmonic Distortion: | <5%                               |
| Genset Starting:           | Manual Handover                   |
| Maximum Step Load:         | 50% of rated power                |

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